



Fine-tuning Central Banks Web Communications: Usability Tests & Content Management

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ABSTRACT

Business processes especially in the Central Banks are more fully integrated and streamlined than ever before. Also, realistic system landscapes often consist of many systems. Disconnected silos of unstructured information continue to pile up for each organizational function and different interfaces are often implemented using the technology that is considered to be ideal for the respective interface. There appears to be lack of Enterprise Content Management strategy thus leading to significant business challenges such as untrustworthy business information due to inaccurate, outdated, conflicting information, longer financial cycles and generally inefficient processes, system performance degradations and poor data organization, inconsistent, confusing user interface as well as frequent context switching.

There is therefore the need for an effective enterprise content management strategy. Web content management systems are often used for storing, controlling, versioning, and publishing industry-specific documentations. Usability testing of web sites is an essential element of quality assurance and a true test of how people actually use Central Banks' web site. It is a test of whether outsiders can successfully use the Banks' Web site. Although formal usability tests are expensive, time-consuming and often prohibitive, periodic user testing is an important element in developing and maintaining a reader-friendly Website. Usability should emphasise clarity of communication, accessibility, consistency, navigation design, maintenance and good visual presentation.

A solution to corporate intranet/internet chaos are Enterprise Portals. An enterprise portal is the gateway to the end user. It offers a central point of access to information, applications and services in an enterprise. It is a one-stop shopping for knowledge workers; the portal is both a gateway to and a destination on the enterprise network that provides transparent, tailored access to distributed digital resource. An Enterprise Portal provides numerous benefits to users, allowing them to interact with relevant information and application, both internal and external to the company, collaborate with others both inside and outside the Central Banks through self-service publishing customise-and-tailor a Web page with information that is easily found.

This paper discusses the issue of Usability Tests and Web Content Management that enhance user productivity. Drawing from some award winning intranets some areas for best practices for the financial services such as the African Central Banks are high-lightened vis-à-vis the infrastructural problems facing the African Continent.

1. GLOSSARY OF TERMS

1.1 A Central Bank, Reserve Bank or Monetary Authority

It is an entity responsible for the [monetary policy](#) of its [country](#) or of a group of member states. Its primary responsibility is to maintain the stability of the national [currency](#) and [money supply](#), but more active duties include controlling subsidized-[loan interest rates](#), and acting as a "bailout" [lender of last resort](#) to the [banking sector](#) during times of financial [crisis](#) (private banks often being integral to the national financial system). It may also have supervisory powers, to ensure that banks and

other financial institutions do not behave recklessly or fraudulently.

In most countries the central bank is state owned and has a minimal degree of autonomy, which allows for the possibility of [government](#) intervening in monetary policy. An "independent central bank" is one which operates under rules designed to prevent political interference.

1.2 Usability

is measured by the quality attribute that assesses how easy user interfaces are to use. Usability could be defined by several quality components, namely, 'learnability',

efficiency, 'memorability', errors recovery and satisfaction

1.3 Web Content Management

is a content management system with additional features to ease the tasks required to publish web content to web sites. A Content Management System (CMS) is a software system used for content management. Content management systems are deployed primarily for interactive use by a potentially large number of contributors.

1.4 An Enterprise Portal

also known as an *enterprise information portal*, is a framework for integrating information, people and processes across organizational boundaries. It provides a single point of entry, often in the form of a web-based [user interface](#), and is designed to aggregate information through application-specific [portlets](#).

2. CONTENT MANAGEMENT

2.1 Content Management

A Content Management System (CMS) is a software system used for content management. Content management systems are deployed primarily for interactive use by a potentially large number of contributors.

The content managed includes computer files, image media, audio files, electronic documents and web content. The idea behind a CMS is to make these files available inter-office, as well as over the web. A Content Management System would most often be used as an archive as well. Many companies use a CMS to store files in a non-proprietary form. Companies use a CMS to share files with ease, as most systems use server-based software, even further broadening file availability. Many Content Management Systems include a feature for Web Content, and some have a feature for a "workflow process."

"Work flow" is the idea of moving an electronic document along for either approval, or for adding content. Some Content Management Systems will easily facilitate this process with email notification, and automated routing. This is ideally a collaborative creation of documents. A CMS facilitates the organization, control, and publication of a large body of documents and other content, such as images and multimedia resources.

Today web sites are an integral part of an organization's operations. No longer relegated to the role of electronic billboards, sites are used to actively promote companies and products, deliver services and information, manage

transactions, and facilitate communications. Changes must be reflected quickly - daily, hourly, or even minute-by-minute. This need for rapid change, the "ripple effect" changes can have throughout a site, and the sheer size of today's dynamic business sites make it impossible for all revisions to flow through one or two people. Complexity and speed have created the demand for automated ways to effectively manage Web content.

2.2 Web Content Management Systems

A web content management system is a content management system with additional features to ease the tasks required to publish web content to web sites.

Web content management systems are often used for storing, controlling, versioning, and publishing industry-specific documentation such as news articles, Operational Policies & Guidelines, Technical Manuals, Central Bank Guidelines, and marketing brochures. A content management system may support the following features:

- Import and creation of documents and multimedia material
- Identification of all key users and their content management roles
- The ability to assign roles and responsibilities to different content categories or types.
- Definition of the content workflow tasks, often coupled with event messaging so that content managers are alerted to changes in content.
- The ability to track and manage multiple versions of a single instance of content.
- The ability to publish the content to a repository to support access to the content. Increasingly, the repository is an inherent part of the system, and incorporates enterprise search and retrieval.
- Some content management systems allow the textual aspect of content to be separated to some extent from formatting. For example the CMS may automatically set default color, fonts, or layouts.

But as with most technologies, not all Web content management solutions are created equal. The design philosophy behind the solution, as well as the architecture employed, can directly impact the suitability of the product for organization's sites. Selecting a Web content management solution that doesn't properly address the requirements can make it difficult to enhance the site's functionality, size, or scope. Overall, organization's productivity and growth will be constrained when content changes can not keep pace with the business environment

and everyone, from content providers and designers to IT professionals - must work harder to compensate for the site's technological shortcomings.

In contrast, the right Web content management solution can enable the organization to save time and money, improve communications, strengthen business relationships, and increase revenues. The right solution also can provide the scalability, flexibility, and enterprise system interoperability necessary to meet future site requirements; an important consideration when the future can arrive in a matter of months. It's an important decision, worthy of further investigation.

Choosing the right Web content management solution requires a good understanding of the capabilities needed to meet organization's current and future operational needs. Knowing how and when the site should deliver content, and to whom - can guide the creation of clear front-end site requirements. But that's only half of the equation. The "back side" of the site also has to be considered. Site deployment, management, maintenance, and infrastructure requirements also must be met.

3. WEB USABILITY AND TESTS

3.1 Web Usability

Web usability is about making a website in such a way that the site users can find what they're looking for quickly and efficiently.

Usability is measured by the quality attribute that assesses how easy user interfaces are to use. The word "usability" also refers to methods for improving ease-of-use during the design process.

Usability is defined by five quality components:

- **Learnability:** How easy is it for users to accomplish basic tasks the first time they encounter the design?
- **Efficiency:** Once users have learned the design, how quickly can they perform tasks?
- **Memorability:** When users return to the design after a period of not using it, how easily can they reestablish proficiency?
- **Errors:** How many errors do users make, how severe are these errors, and how easily can they recover from the errors?
- **Satisfaction:** How pleasant is it to use the design?

There are many other important quality attributes. A key one is **utility**, which refers to the design's functionality: Does it do what users need? Usability and utility are equally important: It matters little that something is easy

if it's not what is required. To study a design's utility, the same user research methods can be used that improve usability.

On the Web, usability is a necessary condition for survival. If a website is difficult to use, people leave. If the homepage fails to clearly state what a company offers and what users can do on the site, people leave. If users get lost on a website, they leave. If a website's information is hard to read or doesn't answer users' key questions, they leave. Note a pattern here? There's no such thing as a user reading a website manual or otherwise spending much time trying to figure out an interface. There are plenty of other websites available; leaving is the first line of defense when users encounter a difficulty. Users have gradually become accustomed to particular layouts and phrases on the Internet, for example:

- Organisation logo is in the top-left corner and links back to the homepage
- The term 'About us' is used for organisation information
- Navigation is in the same place on each page and adjacent to the content
- Anything flashing or placed above the top logo is often an advertisement
- The term 'Shopping cart' is used for items to be purchased.

The importance of these conventions should not be underestimated- as the Internet matures users are getting more and more used to things being a certain way. If these conventions are broken the website will be with poor usability and a handful of dissatisfied site visitors.

3.1.1 Pages Must Download Quickly

Usability studies have shown that 8.6 seconds is the maximum time web users will wait for a page to download (source: Andrew B. King - Speed Up the Site). African Central bank Web site users have great challenges with Internet connectivity and speed. Far more than 10% of users in Africa have broadband so it's essential for optimal usability that the website downloads quickly.

3.1.2 Information should be Easy to Retrieve

Web pages are read in a different manner to the way printed matter is read. Generally pages are not read word-for-word - instead people scan web pages. When people scan web pages certain items stand out:

- Headings
- Link text
- Bold text
- Bulleted lists

The images were left out of that list, contrary to the way in which people read printed matter, people see text before images on the Internet. For optimal website usability do not place important information in images as it might go unnoticed.

3.1.3 Restrictions must not be placed on Users

Don't prevent the users from navigating through the Internet in the way that they want to. For example:

1. Every time a link is opened in a new window the back button is disabled. Approximately 60% of Web users employ the back button as their primary means of navigation (source: Usability Interface). If this is done then 60% of the users are prevented from using their primary navigation - now that can't be good for usability.
2. Don't use frames to lay out website. Frames can cause a number of usability problems, namely:
 - Disabling the back button (see above)
 - Book marking not possible
 - Impossible to e-mail the link to someone else
 - Problems with printing
 - Users feel trapped if external links open in the same window
 - Search engine optimization issues

Many of the African Central bank websites use Frames. Examples are those of South Africa, Zambia, etc

3.2 Web Usability Tests

A usability test is a series of assessment conducted by individuals using a site under procedural guidance of a facilitator. This test is important to find whether outsiders can successfully use a web site. Usability testing of web sites is:

- an essential element of quality assurance
- a true test of how people actually use a web site

Suitable times for testing:

- at the web site's conception (start by testing a printed mockup of the home page)
- before planning a redevelopment
- repeatedly during (re)development, as critical pages or sections are prepared
- when traffic analysis shows an anomaly
- when the owner requires hard information about a page or site.

Web usability test focuses on:

- how do users interact with the web site?
- what is difficult for people to do?
- where do they get confused/lost?
- what makes sense to people?
- what makes them feel distrustful or insecure?
- what do they like and what do they hate?

Web usability tests range from 5 minutes (for a single page design) to 1 hour (for a general response to a whole site or new design). Some formal usability tests are expensive, time-consuming and often prohibitive.

Finding users need not be a problem. User should be

- completely new to the web site
- not involved with the web site in any way
- somewhat familiar with the Web in general.

Web Usability tests are run in the user's home or work place. Benefits:

- the user feels more relaxed
- the user doesn't need to learn new systems
- how the web site works on different computers, browsers and modems.

For web usability test a script is prepared for quality assurance. It helps ensure that consistent procedures are followed, and that each user is requested to do the same task. Before the script is implemented with the real users, test the script with a colleague acting as the user.

3.2.1 Report on Testing

A report is written for each problem the user found and it is to be done immediately after test is fresh in mind. Each problem is marked as serious, less serious, or preference. ('Preference' means matters of opinion, such as whether the colours are pretty. Preferences don't affect usability.)

Solutions are recommended to clearly differentiate the available options and understanding the test observations.

Report is sent to the web development team and problems are discussed to decide which of the problems are easy and economical to fix, and which need further investigation.

4. ENTERPRISE INFORMATION PORTALS

4.1 Enterprise Portals

An enterprise portal, also known as an *enterprise information portal*, is a framework for integrating information, people and processes across organizational boundaries. It provides a single point of entry, often in the form of a web-based [user interface](#), and is designed to aggregate information through application-specific [portlets](#).

Fundamental Features

- **Single Point of Entry** — enterprise portals can provide [single sign-on](#) capabilities between their users and various other systems. This requires a user to authenticate only once. Access control lists manage the mapping between portal content and services over the portal user base.
- **Integration** — the connection of functions and data from multiple systems into new components/[portlets](#).
- **Personalization** — Users can customize the look and feel of their environment. Customers who are using EIPs can edit and design their own web sites which are full of their own personality and own style; they can also choose the specific content and services they prefer.
- **Permissioning** — the ability for portal administrators to limit specific types of content and services users have access to. For example, a central bank's proprietary information can be entitled for only company employee access.

Common Application areas

- Content Management System
- Document Management System
- Collaboration Software
- Customer Relationship Management
- Business Intelligence
- Email Management

- Intranet

There are 20 major EIP vendors such as SAP AG, Oracle Corporation, Sun Microsystems, IBM, Microsoft, BEA Systems, JBoss and many others. Technology are based largely on Sun Microsystems Java 2 Enterprise and Microsoft .NET Platforms. Licensing schemes ranges from General Purpose license and Open source to Commercial. A partial list can be found in the appendix.

4.2 SAP Enterprise Portals

SAP Enterprise Portal is the industry's most comprehensive portal solution. SAP EP unifies collaboration, knowledge management, and relevant content by integrating information, applications, and services.

SAP EP provides people-centric integration of all types of enterprise information, including SAP applications, third-party applications, databases, data warehouses, desktop documents, and Web content and services. It provides employees, supply chain partners, customers, and other communities with immediate, secure, and role-based access to key information and applications across the extended enterprise.

To enable this capability, SAP EP uses an open approach, based on open standards, Web services, and the SAP NetWeaver platform that supports heterogeneous systems from all major technology vendors through Java, J2EE, and Microsoft .NET technologies.

Since information and applications are unified through the portal aspect of the solution, users can identify and address business issues faster, more effectively, and at lower cost, resulting in measurable benefits and strategic advantages.

One of those benefits is lower total cost of ownership (TCO) through the rapid deployment of predefined, portal-based business content that leverages SAP's 30-year experience in building complete business solutions. Other benefits include:

SAP NetWeaver is [SAP's](#) integrated technology platform and is the technical foundation for all SAP applications since the [SAP Business Suite](#). SAP NetWeaver is marketed as a [service-oriented](#) application and [integration](#) platform. SAP NetWeaver provides the development and runtime environment for SAP applications and can be used for custom development and integration with other applications and systems. SAP NetWeaver is built using open standards and industry de facto standards and can be extended with, and interoperate with, technologies such as [Microsoft .NET](#), [Sun Java EE](#), and [IBM WebSphere](#).

4.3 Microsoft SharePoint 2007

SharePoint is a [portal](#)-based collaboration and [document management platform](#) from [Microsoft](#). It can be used to host web sites, termed *SharePoint Portals*, which can be used to access shared workspaces and documents, as well as specialized applications such as [wikis](#) and [blogs](#), from within a browser. SharePoint functionality is exposed as [web parts](#), which are components that implement a certain functionality, such as a task list, or discussion pane. These web parts are then composed into web pages, which are then hosted in the SharePoint portal. SharePoint sites are actually [ASP.NET](#) applications, which are served using [IIS](#) and use a [SQL Server](#) database as data storage backend.

The SharePoint family is composed of three different applications. **Windows SharePoint Services (WSS)** is a free add-on to [Windows Server](#). WSS offers the basic portal infrastructure and collaborative editing of documents, as well document organization and [version control](#) capabilities. It also includes end user functionality such as [workflows](#), to-do lists, alerts and discussion boards,^[1] which are exposed as [web parts](#) to be embedded into SharePoint pages. WSS was previously known as *SharePoint Team Services*.

Microsoft Office SharePoint Server (MOSS) is a paid component of [Microsoft Office](#) suite. MOSS integrates with WSS and adds more functionality to it, including better document management, indexed search functionality, navigation features, [RSS](#) support, [wikis](#) and [blogs](#), as well as features from Microsoft Content Management Server. It also includes features for business data analysis as well as integration with [Microsoft Office](#) applications, such as [project management](#) capabilities or exposing [Microsoft Office InfoPath](#) forms via a browser.^[2] It can also host specific libraries, such as [PowerPoint Template Libraries](#) provided the server components of the specific application are installed. MOSS was previously known as *SharePoint Server* and *SharePoint Portal Server*.

Microsoft Office SharePoint Designer (MOSD) is a [WYSIWYG HTML editor](#), which is primarily aimed at designing SharePoint sites. It shares its rendering engine with [Microsoft Expression Web](#), its general web designing sibling, and Microsoft's [Visual Studio 2008 IDE](#).

5. AWARD WINNING INTRANETS

Over the last 6 years, Nielson Norman Group has conducted Intranet competitions which seeks the best examples of Intranets that are easy to use and meet users needs. Similar exercise is also been done in Nigeria.

Some of the criteria used to judge the usability of Websites are listed below:

Navigation:

- Main navigation on every page
- Consistent/easy navigation
- Consistent style across the intranet
- No horizontal scrolling
- Minimal vertical scrolling

Design:

- Pleasing aesthetics
- Engaging homepage design
- Good contrast between text and background
- Easy-to-read text
- Easy-to-read links
- Good use of graphics
- The right amount of text
- The right number of links
- Clean design

Search:

- Consistently available search
- Relationship to employee search
- Good search design (ideally, a simple open field at the top of pages)

Personalization and News Delivery

- Personalization/catering to different offices or cultures
- Organization-related news
- Information about internal groups

Content

- Well-written text
- Employee directory or directory search
- Content posting and editing capabilities

Overall

- Simple forms
- Support for the main corporate functions
- Encapsulation of the organization's spirit

- Use of innovative, fun, or original features
- Accessibility features

In the 2007 Edition of the Nielson Norman group Intranet competition, the following organisations emerged top 10 winners.

5.1 Published 10 Best Intranets

Organisation	Comments by Nielson Norman Group
American Electric Power (AEP) (United States)	Taking an idea planted at a usability conference and nurtured over dinner — with the aid of a paper tablecloth — American Electric Power applied a world-class design staff and less than \$100,000 to create an unbeatable intranet: the new AEP Now, which informs and inspires employees.
Comcast (United States)	Want a great design? Take risks. That's the lesson from the Comcast Store, an extranet that supports the company's marketing operations. Bold design choices, including expert use of white space and color, enable users to breeze through the site and quickly locate essential information.
DaimlerChrysler AG (Germany)	The DaimlerChrysler AG Employee Portal's clear navigation, personalized content, and extensive intranet applications make it approachable and easy to use, drawing 60,000 users daily.
The Dow Chemical Company (United States)	The Dow intranet's news offerings, clear navigation, and many intranet-based applications support a wide variety of employees and boost productivity — a winning combination.
Infosys Technologies Limited (India)	This intranet has a special mission: To keep pace with the company as it adds almost 50% more employees in a year. Named Sparsh — “to touch” in Sanskrit — this intranet lives up to its billing, achieving three essential yet difficult attributes: to motivate, communicate with, and unify employees.
JPMorgan Chase & Co. (United States)	The redesign mandate: Better meet the incredibly diverse needs of employees, while lowering costs. Add in a merger, and creating a great design might seem unattainable. Through superb planning and unwavering focus, however, the intranet team delivered a world- class intranet.
Microsoft Corporation (United States)	Microsoft's corporate intranet is also the company's primary showcase for Microsoft Office SharePoint Server 2007. The fact that the company's more than 70,000 employees prize it for news, information, and as a guide to Microsoft's many internal sites, however, highlights its success as an intranet.
National Geographic Society (United States)	Taking cues from an organization's existing products can save time, boost focus, and help foster an incredible user experience. Witness NG Insider, the National Geographic Society's intranet, which features a clarity and design reminiscent of the Society's well-known <i>National Geographic</i> magazine.
The Royal Society for the Protection of Birds (RSPB) (United Kingdom)	Just a handful of people maintain The Royal Society for the Protection of Birds' intranet. To judge by its delightful design, however, you'd never know it. This lively website devoted to environmental concerns soars with creativity.
Volvo Group (Sweden)	A testament to the power of clear design and judicious use of templates, this Volvo Group Information Online (Violin) redesign helped rein in 10 years of uncontrolled growth and over 800 websites. The result helps employees speed through their intranet tasks while enjoying the ride.

5.2 Best Practices

From the award winning Intranets some best practices for the Intranet Design Process. They are:

5.2.1 Watch People Work

When designing intranets, don't forget that you already know who the end users are. They're the people you pass in the hallways, the employees sitting next to you in the cafeteria, and the staff who park next to you in the garage. Use these interactions to your advantage and get yourself invited to watch how your colleagues work. See how

they're using and not using the intranet, and where design opportunities exist for making the intranet a more useful part of their day-to-day jobs.

5.2.2 Conduct Usability Evaluations

Remember that you don't need a complete, finished design before you can garner useful usability feedback. In fact, it's better to get early feedback on incomplete designs. Just test with prototypes and paper mockups. Or, if you want to introduce design elements similar to those you see on a particular website, then use that website to test the features. You can watch people using any current system, even if it's not an intranet per se, to determine which features are already well designed.

5.2.3 Help Content Contributors Succeed

The most well-received intranets are those with fresh information that people need and want. One way to keep information updated and interesting is to provide methods for employees to add and edit information. Letting users — or designated content providers — contribute content gives them a stake in the intranet's success.

Such efforts invariably produce compounded returns: fostering excellent content providers results in better content, which invariably leads to an intranet with more varied and useful information, which drives more employees to visit the intranet more often, and thus ensures that the intranet remains a business-critical tool.

5.2.4 Consider Accessibility

Many companies employ — or will at some point hire — people who use assistive technology. Yet, almost all of the intranets submitted for consideration this year posed accessibility problems for users with low vision, no vision, or motor-skill challenges. The chief accessibility offenders: using too many graphics, tiny text, poor contrast, limited space between links and text, and small targets. Unfortunately, at many sites, introducing these exact features seems to be a new trend. On the positive side, while many submissions do overuse graphics, many others use graphics sparingly, and when they do use them, they are well labeled for users with low vision or no vision.

5.2.5 Measure Return on Investment

Most of the winning intranets made obvious strides, fostered great usability improvements, and no doubt created productivity and efficiency gains for their companies. Yet, few intranet teams formally (or even informally) measure any ROI.

Often such measurements are not a priority because of tight schedules and the way in which organizations allocate money. Measure the time users require to accomplish a task, both before and after a redesign. Take this decreased task time and factor the resulting, increased financial savings across your organization. Then, make the gains known to the different departments involved and also at higher levels, so that even the most upper-level managers understand the importance of well-designed internal systems.

6. FINE TUNING CENTRAL BANK WEB COMMUNICATION

6.1 Critique of Some Central Bank Web Sites

For this presentation, a brief usability test was conducted for the African Central Banks as at mid October 2007. The criteria included the following:

- Navigation
- Design
- Search
- Personalization and News Delivery
- Content
- Overall

The result is shown in the table below:

6.2 Areas of Concern

6.2.1 Transparency

Most central banks use their websites intelligently. However, some central banks are failing to pass elementary tests of transparency. 'Presentations and releases of central bank data should meet the standard related to coverage, periodicity, timeliness of data and access by the public that are consistent with data dissemination standards'

6.2.2 Uniformity

There appears not to be a standard format in presenting financial data such as Balance Sheets, financial market statistics, etc and these require experts to interpret them. Central banks should implement a common and similar method of disseminating data, including a common format for central bank websites

6.2.3 Multilanguage

Many Websites do not publish their content in additional language such as English and therefore not useful to many

users. African central banks appears to be operating as if published data is for nationals only. They must think global.

6.2.4 Currency of Data

Central banks should post current, relevant economic and financial data, especially current monthly accounts.

6.2.5 Usability

Usability in terms of navigation, design, personalization and content requires a lot of improvement. Central banks need to approach website as a business and communication challenge. It is also not only for financial gurus only but for the use of entrepreneurs, academicians and of central bank employees.

7. CONCLUSION

Business processes especially in the Central Banks are more fully integrated and streamlined than ever before. Alost all the central banks in Africa have Websites. While financial content published are quite satisfactory, usability, design, data search and personalization of content remains widely unsatisfactory. A possible solution to these is to ensure a good enterprise content management strategy.

For satisfactory usability of websites some of these tested principles will ensure success:

- Be user-centered.
- Integrate - closely with your design team and communicate constantly
- Careful Planning
- Think business - Treat it as a business and communications challenge
- Phase Website project as Redesign is ongoing

Additional areas of concern include:

Transparency - relating to coverage, periodicity, timeliness of data and access by the public that are consistent with data dissemination standards'

Uniformity – African central banks should implement a common and similar method of disseminating data, including a common format for central bank websites

Multilanguage – African central banks appears to be operating as if published data is for their nationals only. They must think global.

Currency of data – Central banks should post current, relevant economic and financial data.

Usability testing of web sites is an essential element of quality assurance and a true test of how people actually use Central Banks' web site. It is a test of whether outsiders can successfully use the Banks' Web site. Although formal usability tests are expensive, time-consuming and often prohibitive, periodic user testing is an important element in developing and maintaining a reader-friendly Website. Usability should emphasise clarity of communication, accessibility, consistency, navigation design, maintenance and good visual presentation.







































A solution to corporate intranet/ internet chaos are Enterprise Portals. An enterprise portal is the gateway to the end user. It offers a central point of access to information, applications and services in an enterprise. It is a one-stop shopping for knowledge workers; the portal is both a gateway to and a destination on the enterprise network that provides transparent, tailored access to distributed digital resource.

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APPENDIX

10.1 Central Banks by Country or Region

-  [Afghanistan](#) – [Da Afghanistan Bank](#)
-  [Albania](#) – [Bank of Albania](#) (*Banka e Shqipërisë*)
-  [Algeria](#) – [Bank of Algeria](#) (*Banque d'Algérie*)
-  [Angola](#) – [Central Bank of Angola](#) (*Banco Nacional de Angola*)
-  [Antigua and Barbuda](#) – see: [Organisation of Eastern Caribbean States](#)
-  [Argentina](#) – [Central Bank of Argentina](#) (*Banco Central de la República Argentina*)
-  [Armenia](#) – [Central Bank of Armenia](#) (*Հայաստանի Կենտրոնական Բանկ*, Hayastani Kentronakan Bank)
-  [Aruba](#) – [Central Bank of Aruba](#) (*Centrale Bank van Aruba*)^[1]
-  [Australia](#) – [Reserve Bank of Australia](#)
-  [Austria](#) – see: [European Union](#)
-  [Azerbaijan](#) – [National Bank of Azerbaijan](#) (*Azərbaycan Milli Bankı*)
-  [Bahamas](#) – [Central Bank of The Bahamas](#)
-  [Bahrain](#) – [Central Bank of Bahrain](#)
-  [Bangladesh](#) – [Bangladesh Bank](#)
-  [Barbados](#) – [Central Bank of Barbados](#)
-  [Belarus](#) – [National Bank of the Republic of Belarus](#) (*Національний банк Республіки Беларусь*)
-  [Belgium](#) – see: [European Union](#)
-  [Belize](#) – [Central Bank of Belize](#)
-  [Benin](#) – see: [West African Economic and Monetary Union](#)
-  [Bermuda](#) – [Bermuda Monetary Authority](#)
-  [Bhutan](#) – [Royal Monetary Authority of Bhutan](#)
-  [Bolivia](#) – [Central Bank of Bolivia](#) (*Banco Central de Bolivia*)
-  [Bosnia and Herzegovina](#) – [Central Bank of Bosnia and Herzegovina](#) (*Centralna Banka Bosne i Hercegovine*)
-  [Botswana](#) – [Bank of Botswana](#)
-  [Brazil](#) – [Central Bank of Brazil](#) (*Banco Central do Brasil*)
-  [Brunei](#) – [Brunei Currency Board](#)
-  [Bulgaria](#) – see: [European Union](#)
-  [Burkina Faso](#) – see: [West African Economic and Monetary Union](#)
-  [Burundi](#) – [Bank of the Republic of Burundi](#) (*Banque de la République du Burundi*)
-  [Cambodia](#) – [National Bank of Cambodia](#)
-  [Cameroon](#) – see: [Economic and Monetary Community of Central Africa](#)
-  [Canada](#) – [Bank of Canada](#) (*Banque du Canada*)
-  [Cape Verde](#) – [Bank of Cape Verde](#) (*Banco de Cabo Verde*)
-  [Cayman Islands](#) – [Cayman Islands Monetary Authority](#)
-  [Central African Republic](#) – see: [Economic and Monetary Community of Central Africa](#)
-  [CFP franc](#) – [Overseas Issuing Institute](#) (*Institut d'émission d'Outre-Mer*)
-  [French Polynesia](#)
-  [New Caledonia](#)
-  [Wallis and Futuna](#)
-  [Chad](#) – see: [Economic and Monetary Community of Central Africa](#)
-  [Chile](#) – [Central Bank of Chile](#) (*Banco Central de Chile*)
-  [China, People's Republic of](#) – [People's Bank of China](#) (*中国人民银行*)
-  [Hong Kong](#) – see: [Hong Kong](#)
- [Macao](#) – see: [Macao](#)
- [China, Republic of \(Taiwan\)](#) – [Central Bank of the Republic of China \(Taiwan\)](#) (*中央銀行*)
- [Colombia](#) – [Bank of the Republic](#) (*Banco de la República*)
- [Comoros](#) – [Central Bank of the Comoros](#) (*Banque Centrale des Comores*)

-  [Congo, Democratic Republic of](#) – [Central Bank of the Congo](#) (*Banque Centrale du Congo*)
-  [Congo, Republic of](#) – see: [Economic and Monetary Community of Central Africa](#)
-  [Costa Rica](#) – [Central Bank of Costa Rica](#) (*Banco Central de Costa Rica*)
-  [Cote d'Ivoire](#) – see: [West African Economic and Monetary Union](#)
-  [Croatia](#) – [Croatian National Bank](#) (*Hrvatska narodna banka*)
-  [Cuba](#) – [Central Bank of Cuba](#) (*Banco Central de Cuba*)
-  [Cyprus](#) – see: [European Union](#)^[2]
-  [Czech Republic](#) – see: [European Union](#)
-  [Denmark](#) – see: [European Union](#)
-  [Djibouti](#) – [Central Bank of Djibouti](#) (*Banque Centrale de Djibouti*)
-  [Dominica](#) – see: [Organisation of Eastern Caribbean States](#)
-  [Dominican Republic](#) – [Central Bank of the Dominican Republic](#) (*Banco Central de la República Dominicana*)
-  [East Timor](#) – [Central Bank of East Timor](#)
- [Economic and Monetary Community of Central Africa](#) – [Bank of Central African States](#) (*Banque des États de l'Afrique Centrale, BEAC*)
 -  [Cameroon](#)
 -  [Central African Republic](#)
 -  [Chad](#)
 -  [Congo, Republic of](#)
 -  [Equatorial Guinea](#)
 -  [Gabon](#)
-  [Ecuador](#) – [Central Bank of Ecuador](#) (*Banco Central del Ecuador*)^[3]
-  [Egypt](#) – [Central Bank of Egypt](#) (*البنك المركزي المصري*)
-  [El Salvador](#) – [Central Reserve Bank of El Salvador](#) (*Banco Central de Reserva de El Salvador*)^[3]
-  [Equatorial Guinea](#) – see: [Economic and Monetary Community of Central Africa](#)
-  [Eritrea](#) – [Bank of Eritrea](#)
-  [Estonia](#) – see: [European Union](#)
-  [Ethiopia](#) – [National Bank of Ethiopia](#)
-  [European Union / European System of Central Banks](#)
 - [Eurosystem](#) – [European Central Bank](#)^[4]
 -  [Austria](#) – [Austrian National Bank](#) (*Oesterreichische Nationalbank*)
 -  [Belgium](#) – [National Bank of Belgium](#) (*Nationale Bank van België / Banque nationale de Belgique*)
 -  [Finland](#) – [Bank of Finland](#) (*Suomen Pankki*)
 -  [France](#) – [Bank of France](#) (*Banque de France*)
 -  [Germany](#) – [Federal Bank of Germany](#) (*Deutsche Bundesbank*)
 -  [Greece](#) – [Bank of Greece](#) (*Τράπεζα της Ελλάδος*)
 -  [Ireland](#) – [Central Bank and Financial Services Authority of Ireland](#) (*Banc Ceannais agus Údarás Seirbhísí Airgeadais na hÉireann*)
 -  [Italy](#) – [Bank of Italy](#) (*Banca d'Italia*)
 -  [Luxembourg](#) – [Central Bank of Luxembourg](#) (*Banque Centrale du Luxembourg*)
 -  [Netherlands](#) – [Netherlands Bank](#) (*De Nederlandsche Bank*)
 -  [Portugal](#) – [Bank of Portugal](#) (*Banco de Portugal*)
 -  [Slovenia](#) – [Bank of Slovenia](#) (*Banka Slovenije*)
 -  [Spain](#) – [Bank of Spain](#) (*Banco de España*)
 - Members of the [European System of Central Banks](#), but not of the Eurosystem:
 -  [Bulgaria](#) – [Bulgarian National Bank](#) (*Българска народна банка*)
 -  [Cyprus](#) – [Central Bank of Cyprus](#) (*Κεντρική Τραπεζα της Κυπρου*)^[2]
 -  [Czech Republic](#) – [Czech National Bank](#) (*Česká národní banka*)
 -  [Denmark](#) – [National Bank of Denmark](#) (*Danmarks Nationalbank*)
 -  [Estonia](#) – [Bank of Estonia](#) (*Eesti Pank*)
 -  [Hungary](#) – [Hungarian National Bank](#) (*Magyar Nemzeti Bank*)
 -  [Latvia](#) – [Bank of Latvia](#) (*Latvijas Banka*)
 -  [Lithuania](#) – [Bank of Lithuania](#) (*Lietuvos Bankas*)
 -  [Malta](#) – [Central Bank of Malta](#) (*Bank Ċentrali ta' Malta*)
 -  [Poland](#) – [National Bank of Poland](#) (*Narodowy Bank Polski*)

-  [Romania](#) – [National Bank of Romania](#) (*Banca Națională a României*)
-  [Slovakia](#) – [National Bank of Slovakia](#) (*Národná banka Slovenska*)
-  [Sweden](#) – [Bank of Sweden](#) (*Sveriges Riksbank*)^[6]
-  [United Kingdom](#) – [Bank of England](#)
-  [Fiji](#) – [Reserve Bank of Fiji](#)
-  [Finland](#) – see: [European Union](#)
-  [France](#) – see: [European Union](#)
-  [French Polynesia](#) – see: [CFP franc](#)
-  [Gabon](#) – see: [Economic and Monetary Community of Central Africa](#)
-  [Gambia](#) – [Central Bank of The Gambia](#)
-  [Germany](#) – see: [European Union](#)
-  [Georgia](#) – [National Bank of Georgia](#) (*საქართველოს ეროვნული ბანკი*)
-  [Ghana](#) – [Bank of Ghana](#)
-  [Greece](#) – see: [European Union](#)
-  [Grenada](#) – see: [Organisation of Eastern Caribbean States](#)
-  [Guatemala](#) – [Bank of Guatemala](#) (*Banco de Guatemala*)
-  [Guinea](#) – [Central Bank of the Republic of Guinea](#) (*Banque Centrale de la République de Guinée*)
-  [Guinea-Bissau](#) – see: [West African Economic and Monetary Union](#)
-  [Guyana](#) – [Bank of Guyana](#)
-  [Haiti](#) – [Bank of the Republic of Haiti](#) (*Banque de la République d'Haïti*)
-  [Honduras](#) – [Central Bank of Honduras](#) (*Banco Central de Honduras*)
-  [Hong Kong](#) – [Hong Kong Monetary Authority](#) (*香港金融管理局*)
-  [Hungary](#) – see: [European Union](#)
-  [Iceland](#) – [Central Bank of Iceland](#) (*Sedlabanki Íslands*)
-  [India](#) – [Reserve Bank of India](#)
-  [Indonesia](#) – [Bank Indonesia](#)
-  [Iran](#) – [Central Bank of the Islamic Republic of Iran](#)
-  [Iraq](#) – [Central Bank of Iraq](#)
-  [Ireland](#) – see: [European Union](#)
-  [Israel](#) – [Bank of Israel](#) (*בנק ישראל*)
-  [Italy](#) – see: [European Union](#)
-  [Jamaica](#) – [Bank of Jamaica](#)
-  [Japan](#) – [Bank of Japan](#) (*日本銀行*)
-  [Jordan](#) – [Central Bank of Jordan](#)
-  [Kazakhstan](#) – [National Bank of Kazakhstan](#) (*Қазақстан Ұлттық Банкі*)
-  [Kenya](#) – [Central Bank of Kenya](#)
-  [Korea, Democratic People's Republic of](#) – [Central Bank of the Democratic People's Republic of Korea](#)
-  [Korea, Republic of](#) – [Bank of Korea](#)
-  [Kuwait](#) – [Central Bank of Kuwait](#)
-  [Kyrgyzstan](#) – [National Bank of the Kyrgyz Republic](#) (*Кыргыз Республикасынын Улуттук Банкы*)
-  [Laos](#) – [Bank of the Lao P.D.R.](#)
-  [Latvia](#) – see: [European Union](#)
-  [Lebanon](#) – [Banque du Liban](#)
-  [Lesotho](#) – [Central Bank of Lesotho](#)
-  [Liberia](#) – [Central Bank of Liberia](#)
-  [Libya](#) – [Central Bank of Libya](#)
- [Liechtenstein](#) – [National Bank of Liechtenstein](#) ^[8]
- [Lithuania](#) – see: [European Union](#)
- [Luxembourg](#) – see: [European Union](#)
- [Macao](#) – [Monetary Authority of Macao](#) (*澳門金融管理局*)^[7]
- [Macedonia, Republic of](#) – [National Bank of the Republic of Macedonia](#) (*Народна банка на Република Македонија*)
- [Madagascar](#) – [Central Bank of Madagascar](#) (*Banque Centrale de Madagascar*)
- [Malawi](#) – [Reserve Bank of Malawi](#)
- [Malaysia](#) – [Bank Negara Malaysia](#)

	Maldives – Maldives Monetary Authority
	Mali – see: West African Economic and Monetary Union
	Malta – see: European Union
	Mauritania – Central Bank of Mauritania (<i>Banque Centrale de Mauritanie</i>)
	Mauritius – Bank of Mauritius
	Mexico – Bank of Mexico (<i>Banco de México</i>)
	Moldova – National Bank of Moldova (<i>Banca Națională a Moldovei</i>) ^[9]
	Mongolia – Bank of Mongolia
	Montenegro – Central Bank of Montenegro (<i>Centralna Banka Crne Gore</i>)
	Montserrat – see: Organisation of Eastern Caribbean States
	Morocco – Bank Al-Maghrib
	Mozambique – Bank of Mozambique (<i>Banco de Moçambique</i>)
	Myanmar – Central Bank of Myanmar
	Namibia – Bank of Namibia
	Nepal – Central Bank of Nepal (<i>Nepal Rastra Bank</i>)
	Netherlands – see: European Union
	Netherlands Antilles – Bank of the Netherlands Antilles (<i>Bank van de Nederlandse Antillen</i>) ^[1]
	New Caledonia – see: CFP franc
	New Zealand – Reserve Bank of New Zealand
	Nicaragua – Central Bank of Nicaragua (<i>Banco Central de Nicaragua</i>)
	Niger – see: West African Economic and Monetary Union
	Nigeria – Central Bank of Nigeria
	Norway – Bank of Norway (<i>Norges Bank</i>)
	Oman – Central Bank of Oman
	Organisation of Eastern Caribbean States – Eastern Caribbean Central Bank ^[10]
	Anguilla
	Antigua and Barbuda
	Dominica
	Grenada
	Montserrat
	Saint Kitts and Nevis
	Saint Lucia
	Saint Vincent and the Grenadines
	Pakistan – State Bank of Pakistan
	Panama – National Bank of Panama (<i>Banco Nacional de Panamá</i>) Although, Panama does not have any official Central Bank.
	Papua New Guinea – Bank of Papua New Guinea
	Paraguay – Central Bank of Paraguay (<i>Banco Central del Paraguay</i>)
	Peru – Central Reserve Bank of Peru (<i>Banco Central de Reserva del Perú</i>)
	Philippines – Central Bank of the Philippines (<i>Bangko Sentral ng Pilipinas</i>)
	Poland – see: European Union
	Portugal – see: European Union
	Qatar – Qatar Central Bank
	Romania – see: European Union
	Russia – Central Bank of the Russian Federation (<i>Центральный банк Российской Федерации</i>)
	Rwanda – National Bank of Rwanda (<i>Banque Nationale du Rwanda</i>)
	Saint Kitts and Nevis – see: Organisation of Eastern Caribbean States
	Saint Lucia – see: Organisation of Eastern Caribbean States
	Saint Vincent and the Grenadines – see: Organisation of Eastern Caribbean States
	Samoa – Central Bank of Samoa
	San Marino – Central Bank of the Republic of San Marino (<i>Banca Centrale della Repubblica di San Marino</i>)
	São Tomé and Príncipe – National Bank of São Tomé and Príncipe (<i>Banco Nacional de São Tomé e Príncipe</i>)
	Saudi Arabia – Saudi Arabian Monetary Agency
	Senegal – see: West African Economic and Monetary Union

	Serbia – National Bank of Serbia (<i>Народна банка Србије / Narodna banka Srbije</i>)
	Seychelles – Central Bank of Seychelles
	Sierra Leone – Bank of Sierra Leone
	Singapore – Monetary Authority of Singapore
	Slovakia – see: European Union
	Slovenia – see: European Union
	Solomon Islands – Central Bank of Solomon Islands
	Somalia – Central Bank of Somalia (<i>Bankiga Dhexe ee Soomaaliya</i>) ^[11]
	Somaliland – Bank of Somaliland (<i>Baanka Somaliland</i>)
	South Africa – South African Reserve Bank
	Spain – see: European Union
	Sri Lanka – Central Bank of Sri Lanka
	Sudan – Bank of Sudan
	Suriname – Central Bank of Suriname (<i>Centrale Bank van Suriname</i>)
	Swaziland – Central Bank of Swaziland
	Sweden – see: European Union
	Switzerland – Swiss National Bank (<i>Schweizerische Nationalbank / Banque Nationale Suisse / Banca Nazionale Svizzera / Banca Naziunala Svizra</i>)
	Syria – Central Bank of Syria
	Tajikistan – National Bank of Tajikistan (<i>Бонки миллии Тоҷикистон</i>)
	Tanzania – Bank of Tanzania
	Thailand – Bank of Thailand (<i>ธนาคารแห่งประเทศไทย</i>)
	Timor-Leste – Banking and Payments Office of Timor-Leste (<i>Autoridade Bancária e de Pagamentos de Timor-Leste</i>)
	Togo – see: West African Economic and Monetary Union
	Tonga – National Reserve Bank of Tonga
	Trinidad and Tobago – Central Bank of Trinidad and Tobago
	Tunisia – Central Bank of Tunisia (<i>Banque Centrale de Tunisie</i>)
	Turkey – Central Bank of the Republic of Turkey (<i>Türkiye Cumhuriyet Merkez Bankası</i>)
	Turkmenistan – State Central Bank of Turkmenistan
	Uganda – Bank of Uganda
	Ukraine – National Bank of Ukraine (<i>Національний банк України</i>)
	United Arab Emirates – Central Bank of the United Arab Emirates
	United Kingdom – see: European Union
	United States of America – Federal Reserve System
	Uruguay – Central Bank of Uruguay (<i>Banco Central del Uruguay</i>)
	Uzbekistan – Central Bank of the Republic of Uzbekistan (<i>O'zbekiston Respublikasi Markaziy Banki / Ўзбекистон Республикаси Марказий Банки</i>)
	Vanuatu – Reserve Bank of Vanuatu
	Vatican City – Institute for Religious Works (<i>Istituto per le Opere di Religione</i>)
	Venezuela – Central Bank of Venezuela (<i>Banco Central de Venezuela</i>)
	Vietnam – State Bank of Vietnam (<i>Ngân hàng nhà nước Việt Nam</i>)
	Wallis and Futuna – see: CFP franc
	West African Economic and Monetary Union – Central Bank of West African States (<i>Banque Centrale des États de l'Afrique de l'Ouest, BCEAO</i>)
	Benin
	Burkina Faso
	Cote d'Ivoire
	Guinea-Bissau
	Mali
	Niger
	Senegal
	Togo
	Yemen – Central Bank of Yemen
	Zambia – Bank of Zambia
	Zimbabwe – Reserve Bank of Zimbabwe

Countries without central banks



10.2 Enterprise Portal Vendors

Vendor	Product Name	Technology	License
Apache Software Foundation	Jetspeed 2.1	J2EE	Apache License
ATG	ATG Portal	J2EE	Commercial
BEA Systems	AquaLogic User Interaction 6.1	J2EE	Commercial
BEA Systems	WebLogic Portal 10	J2EE	Commercial
Broadvision	Broadvision Portal 8.0	J2EE	Commercial
eXo Platform	eXo WebOS 2.0	J2EE	GPL and Commercial
IBM	WebSphere Portal Server 6.0.1	J2EE	Commercial
GridSphere Project	GridSphere Portal Framework 3.0.8	J2EE	GridSphere Open License
JA-SIG	uPortal 2.6.0	J2EE	BSD License
Jahia Software	Jahia Portal 4.2	J2EE	Open Source and Commercial Licenses
JBoss	JBoss Portal 2.6.1	J2EE	LGPL
Liferay	Liferay Portal 4.3.2	J2EE	MIT
Metadot	Metadot Portal Server	Perl	GPL
Microsoft	SharePoint Server 2007	ASP.NET	Commercial
Oracle	Oracle Portal 10g	J2EE	Commercial
Oracle	Oracle WebCenter Suite	J2EE	Commercial
Ovidentia	Ovidentia 6.3.3	PHP	GPL
Iatek	PortalApp 4.0	ASP.NET	Commercial
SAP AG	SAP NetWeaver 7.0	J2EE	Commercial
Sun Microsystems	Sun Java System Portal Server 7.1	J2EE	Open Source, licensing & support plans
Vignette	Vignette Portal 7.3	J2EE	Commercial
Passageways	Passageways Portal Server	ASP.NET	Commercial

Brief of Authors

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Dr. Christian Amaechi Bolu, a Fellow of the Nigeria Society of Nigeria is an Industrial Engineer and Management Information Consultant. He holds a Bachelors Degree in Mechanical Engineering from the University of Nigeria, Nsukka, Master of Engineering Degree in Industrial Engineering from the University of Toronto, Canada and a Doctorate Degree in Management Science from the University of Wales, United Kingdom. He is a registered engineer by COREN.

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Mr Rajiv Sharma holds a B.Sc. from Himachal Pradesh University, India, Post Graduate Diploma in Business Management – D.A.V College Dehradun, India and Diploma in Computer Application – H.P.U. Shimla, India. He is experienced in Business Development, Profit Centre Management, Project Management and Channel Development in IT Training industry. A holder of the Green Belt Six Sigma

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Prior to his present appointment as the Manager of NIIT Education Centres in Lagos area, he has worked in the following organisations in India - Wipro Technologies & BPO, New Delhi, Samtech InfoNet Ltd, New Delhi, Megatech Information Services as Executive Director, NIIT Chandigarh / Shimla

Mr Rishi Malik

Mr Rishi Malik holds B.Com (Hons.) degree and a Post Graduate diplomas in Business Management (Mktg. & I.T.) and Software Development from NIIT.

Mr Malik is a Microsoft certified solution developer and has skills in RDBMS, Web technologies, Distributed programming technologies, Operating systems, programming languages. Prior to his present employment as Channel Development & Support Manager for NIIT in Nigeria, he has worked in NIIT Limited, India for several years